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DESTRUCTION OF THE CROTON DAM, WITH PLAN AND SECTIONS (See page 233.)
BY W. R. CASEY, CIVIL ENGINEER.

Bailey vs. the Corporation of New York.—This was an action to recover damages, caused by the giving way of the Croton dam on the 8th January, 1841, on the ground that the dam was negligently and unskilfully planned and constructed. The great points of objection were, that the waterway was insufficient to pass floods such as those of 1837 and 1839, and that the structure itself was, for various reasons, unsafe and injudicious.

One proof of the want of waterway was as follows: two hours before the dam gave way the water was up to the coping of the parapet wall. A messenger was then despatched to warn the people below that the dam could not stand much longer; yet, half an hour before it burst away, the water in Bailey's mill pond, two miles below, was six inches lower than in previous floods. So that however great the flood may have been *after* the dam gave way, at that moment it had not reached ordinary high water mark, as in 1837 and 1839.

This was confirmed by the following surveys and calculations. No dams remaining across the Croton river, the dams on five of the six main tributaries were measured, and the sixth, on which there was no dam, was approximated. These dams vary in length from 50 to 107 feet, with a depth above the lip in time of freshets, of from 3 to 6 feet 10 inches. These streams are—commencing near the dam—the Kisco, Muscoot, Cross river, Titicus, East and West Branches of Croton.⁽¹⁾ The rise was taken from 50 to 100 feet above the overfalls, not only to avoid the depression which takes place for some distance above the lip, but, because in this case, it was the height to which the water would rise at the head of the masonry, about 90 feet above the lip, which was alone important. As soon as it reached the coping, the destruction of the dam was of course certain.

The height of the parapet wall between the waterway and the embank-

(1.) This calculation makes no allowance for the four or five times greater velocity of the water in the shallow mill ponds of the tributaries, as compared with the gentle flow through the Croton lake, 4 miles long and 30 to 40 feet deep, or for the greater ease with which the water reaches the overfall of these dams, nor does it take into account three considerable brooks and eight or ten minor streams—insignificant in droughts, but torrents during a freshet.

ment is 12 feet above the lip, and the city engineers claimed an efficient waterway of 85 feet in width and 12 feet in depth! They also claimed as efficient waterway, after the water has risen 8 feet on the lip, the breadth of the platform leading into the culvert house! The writer considered 80 feet as very liberal, and doubts whether many engineers could be found who would consider this dam as equivalent to one with 70 feet lip, at right angles to the current, and with skilfully projected or even decent approaches so as to make the discharge something near a maximum. The area claimed above, whether as regards depth or breadth, requires no refutation beyond its mere statement, it being hard to say, whether narrowing the waterway of a dam 40 feet high, so as to have 12 feet on the lip in freshets, and the water flush with the upper surface of the parapet wall, shows less acquaintance with practical engineering, than does the claiming, as efficient waterway, the width of the platform, below the culvert house, prove ignorance of the principles of hydraulics.

Now the measures of these various streams for 1839, when reduced to a lip of 80 feet, gave a depth of 12.8 feet; to 85 feet, 12.6 feet; to 75 feet, 13.4 feet. It was objected to this mode of calculation that the tributaries do not reach their maximum at the same moment—an objection of course foreseen and to which the equalizing⁽²⁾ effect of the 400 acres of the Croton lake and the circumstances detailed in Note 1 were considered a fair offset. But the object of course was to obtain the relative not the absolute rise, though it will be seen, that even this latter was very closely approximated. With reference to the former the objection vanishes.

This mode was adopted in 1841, and the flood of 1843 gave a good opportunity of testing its accuracy. The measurements of the flood of 1843 gave a depth of 13.4 feet on 80 feet=12.9 feet on 85 feet=6 feet on 269 feet. The actual height was given as about 6 feet on the new dam 251 feet long, or adding the discharge through the culvert and aqueduct,=a lip of 258. From observations made the morning after the flood, the writer has much confidence in stating the depth at 6.33 feet. The flood of 1841 was calculated in the same manner, and gave a depth of 14.5 feet on 85 feet lip. So the floods of 1839, 1841 and 1843 are to each other as 1, 1.16, 1.03, according to evidence given on the trial. But, taking into consideration some modifying circumstances, which would have occupied too much time in a court of justice, the floods of 1839, 1841 and 1843 are to each other as 1.04, 1.14, 1.00. In 1839 the dam on Cross river gave way during the freshet, the

(2.) To prove this, take Hoghill brook, one of those omitted in the calculation. This stream has risen 4 feet on an overfall of 32 feet = about 1,400 c. feet per second, sufficient to raise the 400 acres of the Croton lake 3.5 inches in one hour; but, during that hour, the discharge over 85 feet, with a depth of 3.5 inches, would not lower the lake one-fourth of an inch. Hence, several hours would elapse before the minor streams would raise the lake high enough to make their escape over the Croton dam as fast as they come in above. But it is proverbial on the Croton, that, when the small streams fall, the large ones begin to rise, and in the natural state of the river the former would be in or pretty near the Hudson, only 8 miles distant, instead of being, as now, pent up in the Croton lake until the main tributaries come down and pour their floods over the Croton dam simultaneously with the waters of the minor streams. Again, although in the freshet of 1843 the tributaries fell more rapidly than ever before observed, the water on the Croton dam rose to and receded from its maximum very slowly, obviously on account of the equalizing power of the Croton lake.

subsequent rise was not taken into account in the evidence, by which omission the flood of 1839 appeared less than that of 1843.

Again, it was proved that the flood of 1837 rose from 15 to 18 inches above the brick floor of Bailey's rolling mill, and, 2 or 3 square feet of this being fortunately left, the writer took the level of this fragment of the wreck, and found it 20 inches below extreme high water mark of 1843. The resident engineer testified that the flood of 1839 was only 7 inches higher than that of 1837, so that the freshets of 1839 and 1843 were shown to be nearly equal by two independent measurements: 1, by measurement of the tributaries; 2, by their near equality with the flood of 1837, and consequently with each other. Lastly, it has been stated, that half an hour before the dam gave way, the water at Bailey's dam was 6 inches lower than in 1839—it was further proved by all witnesses living on the Croton, at or near the site of the dam, that the flood of 1839 rather exceeded that of 1841, by observations taken as soon as the "lake" had run out and the river had resumed its natural appearance.⁽³⁾ So that in fact, the defendants were indebted to the writer—the plaintiff's engineer—for the only plausible reason that the flood of 1841 might have slightly exceeded that of 1839. An examination into the peculiarities of the floods of 1839, 1841 and 1843 will satisfactorily explain all. In 1839 the freshet was general, all the streams being high—in 1841, the Muscoot and the two branches of the Croton were very high—in 1843, the minor streams and the Cross river were higher than ever since the great July flood, 46 years ago. Now, the east and west branches having their sources at a great distance, and draining a greater area than all the other streams together, do not discharge their floods into the lake till some hours after these latter have been falling, which they do with great rapidity. Hence the entire Croton may have been higher at the point of observation, two miles above the dam, in 1839 than in 1841, though the total discharge into the Hudson may have been much greater in 1841 than 1839. It is the highest rise during the flood which is alone important in this investigation.

Another view may be taken of the requisite waterway to pass any floods which can be expected. The writer was examining the streams of the Croton for the third time in March last, and from personal observation of the storm, has no hesitation in stating, that, considering the rain only lasted 12 hours, that the snow was nearly all in drifts and a large portion of it left, that 12 hours after the rain ceased, the wind chopped round to north-west, causing the tributaries to fall more rapidly than ever before known, and actually preventing the two main branches from reaching their ordinary flood mark—combining all these circumstances, he can only view the flood of 1843 as an ordinary high freshet, such as has occurred four times during the last seven years. Had the rain lasted two hours longer, and had the weather

(3.) It is well known that the Croton attains its maximum about 12 hours after the rain ceases, which would give the highest water on the 8th January, 1841, about 10 or 11 A. M., when it was proved, beyond all doubt, that it did not quite equal the flood of 1839, at a point two miles above the dam, and below all the main tributaries.

cleared off warm, the flood of 1843 must have stood 6 feet on the very edge of the fall and between 7 and 8 feet at the upper end of the culvert house. Had the snow of 1836 gone off as rapidly as in 1839, the flood must have been almost twice as great as that of 1843. Such occurrences are anything but impossible, and common prudence would lead us to anticipate them. Yet every engineer will see that the floods of 1837, 1839 and 1843 were far more than sufficient to have swept away the old dam, and if we allow one half for any flood which can be expected, we shall have a waterway of about 400 feet, supposing the water in the pond not to rise more than 6 feet above the lip. To withstand this column of water will require much more substantial work than is, or rather was, to be found at the foot of either the old or the new dam.

The water commissioners say in the first part of their report, 11th January, 1841, (Doc. 39, p. 513,)—"The width of the sheet of water flowing over the dam is 90 feet, and it is supposed in time of a freshet, will be from 4 to 6 feet deep; it has already, in the last autumn, been equal to 3 feet."

In the same report, after the news of the flood had reached them, they say: (p. 534,) "We have stated above, that the calculation was, that the water might rise from 4 to 6 feet above the overfall dam, but instead of this, it rose to about 15, and for this rise the dam was not calculated; the earthen embankment gave no protection against such a height of water; and the overfall was not of a capacity, although 90 feet in length, to discharge the water which the flood brought down. * * It is obvious that greater provision must be made to allow this stream to pass, in its natural channel, in time of freshets."

Here it will be seen that nearly two years after the flood of 1839, the commissioners—of course by authority of their engineers—state that the Croton will rise from 4 to 6 feet on their dam, when the Muscote alone in 1839 rose 4 feet on a lip of 82 feet; the Titicus $4\frac{1}{2}$ feet on 73, and the two branches of Croton united, above 6 feet on 100. In March last the Cross river rose 5 feet on 107 feet, which, taking into account the greater velocity of approach, is more than the entire Croton was ever to discharge, according to the views of the commissioners and their engineers.

The defendants asserted, that the flood of 1841 was not only greater than any previous known flood, but so much greater that it could not possibly have been foreseen. That they had a waterway capable of passing 50 per cent. more water than passed in the flood of 1839. The choice lay between exaggerating the flood of 1841 or underrating that of 1839. The latter course was adopted, thus: the freshet of 1839 occurring during the construction of the dam filled an area of 1028 square feet, including its own additions to the prepared waterway; the flood of 1843 filled an area of 1472 feet at Tompkins' bridge one-fourth mile below, and, *assuming* the velocities to be equal, the flood of 1839 would rise 7 feet 4 inches on a lip of 85 feet, the flood of 1843 would rise 10.64 for 85 feet—the depth being in both

cases taken at the edge of the fall. The flood of 1841 was taken as equal to 13 feet on S5, though nothing can be more uncertain than its depth on the lip for some time before the dam gave way. It will be observed that the flood of 1843 was necessary to the assumption, the whole statement having been prepared for the trial.

Another calculation, the surveys for which were made a few weeks before the trial, was presented, based on the *assumption* that the rise in floods was proportional to the area drained—contour of ground, clearing of land, and aspect going for nothing—and that all the tributaries were equally affected by the same flood. Unfortunately for this latter theory, the lower tributaries, draining one-third less land, discharged in 1843 one-third more water than the upper tributaries, owing to local causes, and sudden change of weather.

But the most extraordinary circumstance of this defence was that no measurement whatever of the absolute quantity of water passing in freshets was taken previous to, or during the construction of the dam. The area of the flood of 1839 was known, but the velocity was not taken. Now there was Bailey's dam within half an hour's walk of the Croton dam, over which had passed the floods of 1837 and 1839, and where proof of the most overwhelming kind would have been furnished any day, that ordinary prudence required a waterway quite as large as that of the new dam—250 feet. It did not appear that any marks had been established, or anything whatever done to determine the maximum flow of the Croton, before the completion of the dam. The freshet of 1843 ran over the floor of the bridge below the new dam, so that even up to 1843 the flow of the Croton in high floods was an enigma to the chief engineer, who, it appeared on the trial, had paid peculiar attention to the work.

In judging of the construction of the dam, it must be borne in mind that the engineer had "*carte blanche*" as to location, plan, dimensions, material, and—last though not least—time, to say nothing of competent assistants—in short every advantage which could possibly be desired. Justice to him requires us to consider this as his "*beau idéal*" of a permanent dam, for the most important of all purposes for which any structure can be designed, in which his principal assistant coincided, testifying that he considered it to be a structure of "*unexampled strength*." The resident engineer gave no opinion on the subject.

The writer's objections were: that the approach was bad, that the entrance should be somewhat in the style of that of a lock or culvert, instead of converging up stream, that the angular wingwall presented the junction of earth and vertical masonry to the current, instead of being carried around 40 feet into the solid bank, thus aiding the discharge as well as increasing the stability; that the greater part of this wingwall rested on a crib of concrete, and on account of unequal settling, was carried up without any bond, "*rich grout*" being poured into the seam whenever any settling took place, and that

a very small opening of this joint would render the loss of the dam inevitable. That the loss of the apron endangered the dam by causing the undermining of the protection wall at its junction with the apron and masonry, which would be followed by the sand of the embankment till the latter became too weak to stand against the pressure from above.

Mr. Clowes, an experienced engineer, objected to the embankment "in toto," that a wall of hydraulic masonry should have been carried across the valley; that the dam should have been arranged with flash-boards for summer, so as to keep the permanent lip as low as possible, every foot in height being an object with such a mass of water; that, over a smaller river than the Croton, he had, from prudential considerations—the result of 30 years observation—built a dam with a tumble or lip of 400 feet with less than one-third the fall of the Croton dam; that it was injudicious to make the reservoir in the river, when there were so many opportunities of making more secure ones in vallies crossed between Sing Sing and the Harlem river.

It was urged on the defence that, though the entrance was narrower it was much deeper than at the lip, and gave a much greater section, hence the width was unimportant; in other words, it might have been worse had the depth as well as the breadth been reduced. The wingwall was not to add any strength to the dam, but merely to keep the embankment from filling the culvert, 17 feet below the lip, hence a slight opening of the seam—even if it did take place—would be harmless. That to carry the wingwall 40 feet into the bank would be an unheard of precaution, and that the pressure of the earth against the masonry with one or two little projections running 8 or 10 feet into the embankment was abundantly sufficient. The only remark bearing on the apron was, that it was admitted to be quite inadequate to withstand the action of 10 feet (4) water on the lip, though an efficient waterway of 12 feet had been previously claimed by the very same engineers—the only engineers giving evidence on the part of the defendants. Mr. Clowes had objected also to the quality of the earth forming the embankment—principally sand—with a tendency to quicksand; the engineers of the city considering it a good material for the purpose, being composed of sand, gravel and loam. The writer observed also that the thickness of the banks of the enlarged part of the Erie canal was 7 times the depth, about the same proportion as obtained here, *except* at the wingwall, where the embankment offered the least resistance though the pressure was the greatest.

Numerous other subjects came up, as the value of the cribwork in the embankment, the almost universality of the custom of making the lip much wider than the stream in its natural state in place of as here, narrower, but

(4.) The apron of the new dam was torn out by the freshet of March last, though the face of the waterway is curved so that the water leaves the foot of the masonry in a horizontal direction. Still the apron of crib work—unquestionably superior to that of the old dam—gave way the first flood with four and a half feet water on the lip; the water excavated a large hole at the foot of the masonry and it will require great exertions, a large expenditure, and good luck, as regards weather, to render the dam reasonably secure against a great flood next spring. Its fate, with a great summer flood—such as has been known in the Croton—would be scarcely doubtful, and viewed even in the most favorable light, the condition of the dam is, at this moment, most unsatisfactory.

above all, the propriety of carrying a vertical stratum impervious to water entirely across the valley, as for instance a wall of masonry founded on solid rock or secured by two or three rows of well-jointed piling, etc., in short, that at least all the precautions taken on works of far less importance should have been found here.

Appearances after the flood were described to have been as follows: embankment and protection wall gone, masonry of dam proper, generally uninjured, except a few of the lower courses of the face of the dam which were carried away. The first course was stepped into the solid rock, and this being unable to withstand the action of the water, the masonry of course followed and many pieces were carried far down the river. The wingwall from the joint northward was gone, also the crib of concrete—one piece, more than 20 tons in weight, having been carried several hundred feet down the river—also a large crib sunk across the natural channel, near the head of the masonry, used as a cofferdam during the construction of the work. The filling of the old channel was taken out down to, or below the original bed and the foundations of the remaining masonry, where not of solid rock, were torn from under, so that a bar could be in some places run from 4 to 6 feet under the abutment wall. Yet 60 feet north of the masonry, and on the same level, the sand and gravel remained undisturbed, showing an almost irresistible force acting along the base of the abutment, yet confined to so narrow a space as to have been harmless at the trifling distance of 50 or 60 feet north of it. Apron entirely gone and 20 feet of water in its place.

This description agreed well with the appearance of the dam in July, 1841, when visited by the writer. The water was then very low and the powerful action of the flood near the foot of the masonry was so clearly indicated, that he had no hesitation in concluding, that such effects could have been produced by undermining only.

The destruction of the dam on the 8th was considered a matter of course in that part of the country, and would have been honored with a large audience had it taken place by daylight. As it was, it was seen only by those at work on the embankment, and by one man on the south side of the river. The former, witnesses for the defendants, were one of the contractors, (Crandall,) a superintendant of masonry, (Adamson,) and a laborer. They testified that the water forced it way between the frozen and soft earth, that it broke out about 100 feet north of the masonry, and about 8 feet below the top of the embankment, running over the protection wall and widening to a channel of 150 feet, but leaving about 40 feet of the embankment and protection wall standing next the masonry; that this continued for about an hour, at the end of which time the water was still running over the lip of the dam proper. The witness for the plaintiff, (Green,) a very intelligent mechanic, who stood on the south bank, swore, that just before the dam gave way he observed a whirlpool immediately above the wingwall, suddenly the

water receded from the bank and burst through the foot of the embankment at the masonry, the protection wall above, falling, as it were, up stream. The hill on which he stood trembled with the shock, and the noise was heard for miles in all directions.

A son of one of the contractors, (Brayton,) on the part of the plaintiff, testified that two hours before the dam gave way, the earth behind the wing-wall was very soft, that water was to be seen on the lower side of the wall in violent agitation, that the men on the dam were trying to fill the hole up, and that a load of earth was dumped in. This was admitted by Crandall, who ascribed the softness of the earth to the rain.

It will be observed that Green swore that the embankment next the masonry went first—Crandall and Adamson that, an hour after the water broke through, it was the only portion left. There is no reconciling these statements. Whether it be physically possible that an embankment of sand, supported by a dry wall, should stand as a dam 40 feet high, for one hour with 8 to 10 feet of water rushing over it and that this same mass of water, aided by 400 acres of ice, should fall during that time from that height without disturbing the sand and gravel on which it fell, are questions to which but one answer can be given. But, independently of this, it was contended that the appearances near the dam—the rapid falling of the lake two miles above the dam, 6 or 8 feet in 1 or 2 minutes—the noise distinctly heard 6 miles off—the marks of the ice on trees 30 feet above the level of the river—the rise of more than 20 feet at Bailey's wire works, though the valley is a quarter of a mile wide and two miles below the dam, sweeping away houses, barns, mills and even heavy rolling machinery in its mad career, showed conclusively that the dam gave way at once, instead of being gradually washed down.

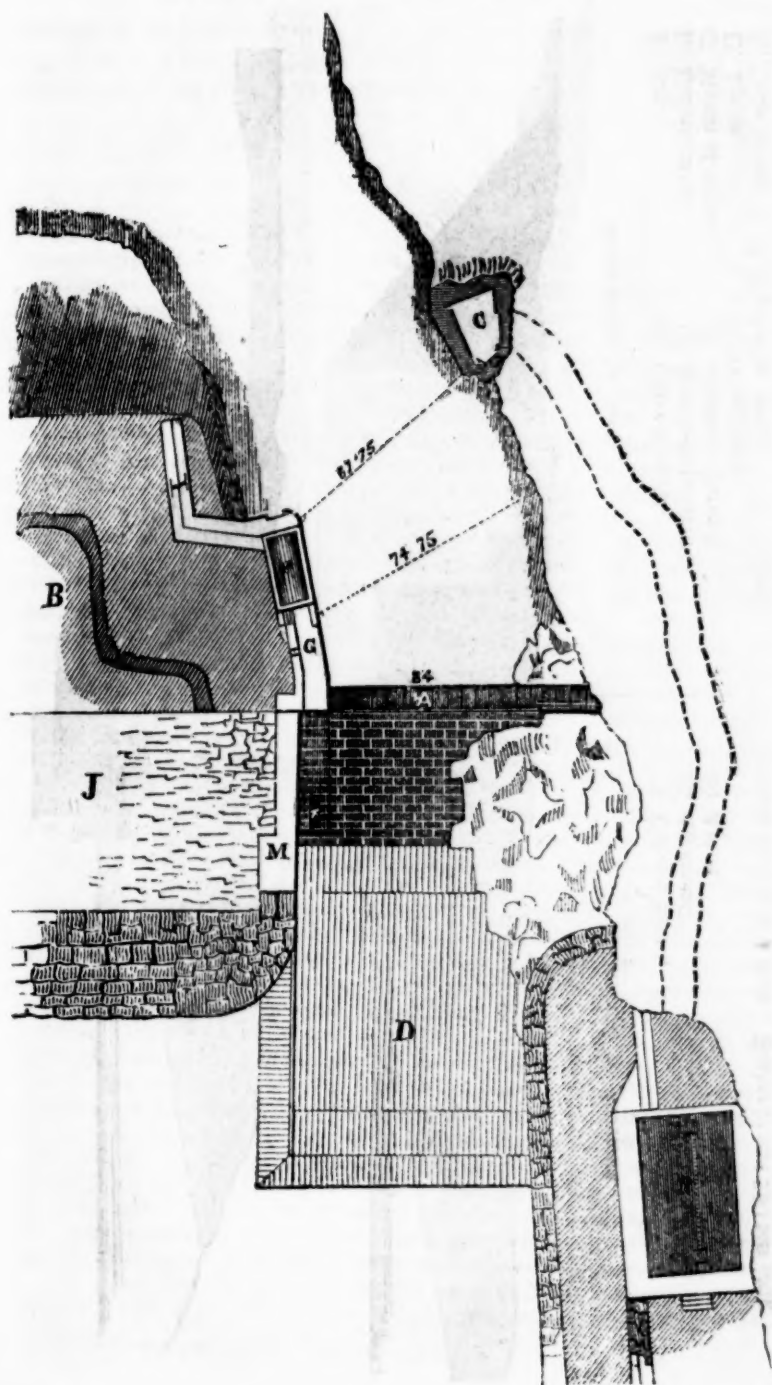
The grand argument on the part of the defence was, however, the high standing of Mr. John B. Jervis, an engineer at the head of his profession in this country, the greatest country for public works, in short the "greatest practical engineer" of the age, just about to retire on his laurels, which would be withered by a verdict for the plaintiffs. Still if they believed negligence to be proved, they must find for the plaintiffs, "*and let the country bleed.*"

The cool, contemptuous style of the following remarks of the commissioners—one of them an engineer of high standing and great experience—says more than the most violent invective could do; the common sense view in the last passage, as obvious as it is irresistible, would of itself have justified the verdict rendered for the plaintiffs. (The italics are the writer's.)

Doc. 17, Report of the Water Commissioners, 12th July. 1841, p. 87. "The construction of the dam *now* building, will, according to the estimates, amount to about one hundred and twenty-seven thousand dollars; but it must be recollected that *this* dam will be a *mason work* dam, laid in hydraulic cement, in the place of the *mere* earthen filling in, with a *dry* protection wall laid with *rough* stone, so that the dam when *now* finished will be an *entirely* different structure from *that* part of the dam carried away, and will *correspond* in strength and durability with the *rest* of the work, certainly much more so than the dam as *formerly* constructed; and as the dam *creates the supply, the importance of its strength and durability, in the original construction, is very obvious.*"

New York, July, 1843.

NOTE. Of the numerous works on hydraulics consulted by the writer, no one gave so good a view of this branch of the science as Mr. Roebing's essay, published in this Journal, December, 1838.



A, Lip,
B, Embankment,
C, Mouth of tunnel,
D, Apron,
E, Gate house,

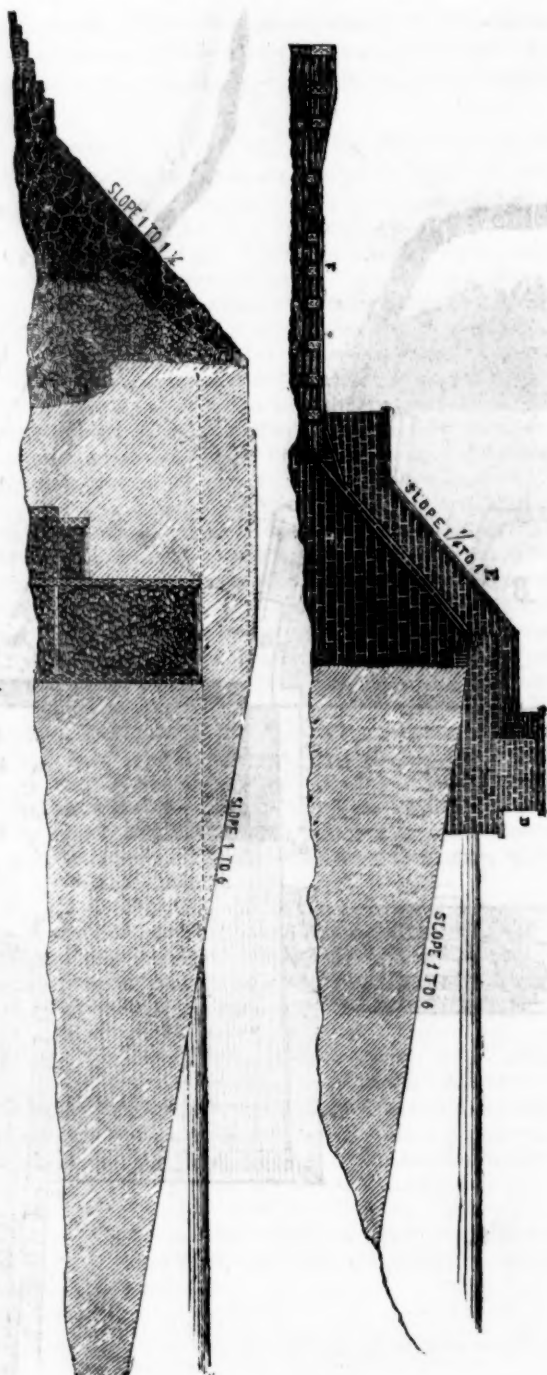
F, Culvert house,
G, Abutment platform,
H, Abutment parapet,
I, Wing wall,
J, Protection wall, K, Culvert.

REFERENCES TO PLAN.

REFERENCE TO SECTION.

D, Culvert house,
E, Abutment,
F, Apron,

Scale 60 feet to 1 inch. Embankment 250 feet long.



RAILROADS IN GERMANY.

The year's result of the German railroads at present in activity has been published, and shows an increase of nearly two millions of travellers in 1842 as compared with 1841. The following table will show the number of passengers and the amount, (in English money,) received for passengers and goods during the month of December, and during the whole of the year 1842.

Names of Railroads.	During December, 1842.		During the whole of 1842.	
	Number of passengers.	Money received.	Number of passengers.	Money received.
Linz-Budweis,	None.	£1,566	14,274	£23,992
Linz-Gmunden,	5,556	1,258	121,155	20,055
Leipzig-Altenburg,	8,173	1,072	43,622	5,266
Munich-Augsburg,	9,229	1,563	213,647	26,865
Hamburg Bergedorf,	9,315	242	153,648	5,277
Berlin-Stettin,	12,135		70,880	
Berlin-Frankfort,	13,278	2,186	35,274	7,385
Breslau-Oppeln,	14,236	932	139,099	8,633
Manheim-Heidelberg,	16,506	522	307,692	9,696
Cologne-Aix la Chapelle,	17,760	2,439	317,776	39,914
Dusseldorf-Elberfeld,	19,113	1,153	384,946	
Brunswick-Harzburg,	20,700	2,329	289,454	14,893
Berlin-Anhalt,	20,925	5,873	318,659	79,577
Vienna-Stockerau,	20,826	1,076	321,490	14,894
Vienna-Brunn-Olmütz,	21,638	9,416	297,505	110,617
Magdeburg-Leipzig,*				
Leipzig-Dresden,	24,932	7,465	377,380	98,579
Berlin-Potsdam,	30,505	1,565	500,906	23,692
Mentz-Frankfort,	32,811	1,487	809,012	37,795
Nuremberg-Furth,	33,874	402	450,635	5,271
Vienna-Raab,	36,535	3,795	1,151,393	71,641

The total number of passengers during the month of December, (without including Magdeburg and Leipzig,) was 368,049; the number in the corresponding month of 1841, was 289,864. During the whole year of 1842, the number of passengers was 6,829,002, whereas in 1841, the number was 5,071,342; so that, on the whole year, there appears an increase of 1,757,660. In the returns of several of the lines the amount received is not specified, owing to their not having made up their accounts for the last quarter at the time the general statement was made up. Approximate calculations have in the mean time been made, according to which the whole number of travellers, along all the lines, has been estimated at 6,870,000, and the amount received 7,000,000 Rhenish florins, or about £583,333; a sum perhaps less than was anticipated by the original estimates of the different companies, but which must still be looked on as large, when the circumstance is taken into account that the majority of the twenty-one railroads enumerated in the above table are still incomplete, or are only portions of a more extensive system, the real traffic of which will not be known until the whole system has been brought into activity. Even those lines which are complete, such as the lines that connect Berlin and Dresden, or Vienna and Olmütz, will probably become much more productive to their proprietors when the other lines now in construction shall have covered all Germany with a net of railroads.

The Linz Budweis railroad conveys no passengers during the winter months, owing to the accumulation of snow in the mountains, and the con-

* Had made no return at the end of January.

sequent impossibility of making the trips with any degree of regularity. Indeed, upon all the German railroads, it will be seen the number of travellers was small in December, compared to the monthly average of the year.

The Leipzig-Altenburg line is only the commencement of one which is to connect the chief cities of Saxony with those of Bavaria. The road was partially opened to Altenburg on the 19th of September, and will in a few months be further opened to Crimmitschau. The Bavarian government seems determined that that part of the railroad which will traverse Bavarian ground shall be constructed with the least possible delay. The railroad is to enter the Bavarian territory at Hof, whence it is to pass through Augsburg and Nuremberg, and run on to the southern frontier at Lindau; thus traversing the entire kingdom from north to south, a distance of about one hundred and fifty leagues. The bill for the construction of this railroad has been submitted to the Bavarian Chambers. The expenses of the construction are to be covered by a loan.

The Munich-Augsburg company have declared a dividend for the year, on their shares, of three per cent. We have not heard whether the shareholders have made up their differences with the directors, or whether the company can yet be said to have lost the unenviable distinction of being the worst managed of all the German railroads.

The line, however, which at the present moment justly excites the greatest interest in Germany, and which to England is of more importance than all the other German railroads put together, is the projected line from Hamburg to Berlin, of which as yet only a few miles have been completed, viz., from Hamburg to Bergedorf. The enterprising mercantile community of Hamburg were, if we mistake not, the first in Germany to bestir themselves for the establishment of railroads, but encountered so many obstacles in the jealousy of their neighbors, that one plan after another was abandoned in despair. It was at length, however, determined that so much of the line towards Berlin as ran upon their own territory should be executed at all events, and they calculated that when a commencement had been made, they would find it all the easier to overcome *personal* objections. All opposition on the part of Denmark and Mecklenburg has gradually been overcome, the political difficulties to the undertaking have been all obviated, and nothing now remains but to raise the necessary capital in order to proceed with the construction of the railroad.

In ordinary times there would be no difficulty in obtaining, in Hamburg and Berlin, purchasers for all the shares in such an undertaking as a railroad intended to connect the two cities; but at the present time several circumstances contribute to impede the prompt filling up of the subscription list. The calamity which befel Hamburg last May is still severely felt there, independently of which Hamburg has largely participated in the effects of that commercial depression under which England has now been suffering for so considerable a time. Many of the citizens of Hamburg have passed from affluence to poverty in consequence of the great fire, and many more are probably still struggling to conceal from the world the state of insolvency to which that calamity has reduced them. Capital is, therefore, necessarily less abundant in Hamburg now than in more prosperous times, and other circumstances contribute just now in Germany to invite the investment of surplus capital in other undertakings. The king of Prussia has projected a colossal system of railroads to radiate from his capital towards the extreme points of his kingdom. Many of the lines which he has determined on, and which have received the sanction of the States, however important they may be in a political or military point of view are not likely to produce much

profit to those who would make them at their own risk; the king, in order, nevertheless, to insure their construction, has guarantied to the capitalists who will undertake them a minimum interest of three and a half per cent. This guaranty fund is not to be extended to the line from Berlin to Hamburg, which has been looked on by the Prussian government as so secure a speculation that no guaranty from the State would be requisite to induce capitalists to enter upon it. Eventually this anticipation will no doubt be fully justified; but in the mean time, what may be called the State railroads in Prussia, will by many be deemed a safer investment, the Prussian government guarantying the dividends on the shares, not merely from the time when the railroads shall have been completed, but from the day when the works commence.

In addition to these circumstances, there are certain local jealousies and rivalries that are exerting such means as they have at their command to delay, if they cannot wholly prevent, the construction of the railroad between Hamburg and Berlin. When the lines now in construction are completed, there will be two great lines extending, the one from Trieste, over Vienna, Prague and Dresden, to Antwerp; and the other from Trieste, over Vienna, Breslau and Berlin, to Hamburg. Should the line to Antwerp be finished sooner than that to Hamburg, there can scarcely be a doubt that the Antwerp line would become the main artery for German commerce, and that much of the trade of Hamburg would be drawn off by her Belgian rival. It may be worth while to present the present state of these two lines to our readers in a tabular form.

	Ready.	In construction.
From Trieste to Gloggnitz,		50 miles.
From Gloggnitz to Olmutz,	40 miles	
From Olmutz to Prague,		32 miles.
From Prague to Dresden,		20 miles.
From Dresden to Magdeburg,	30 miles	
From Magdeburg to Hanover,	20 miles	{ Not yet opened, but certain to be opened in a few months.
From Hanover to Cologne,		48 miles.
From Cologne to Antwerp, (or Ostend,)	40 miles.	
	<u>130 miles.</u>	<u>150 miles.</u>

Of the line from Trieste to Antwerp, therefore, 130 (German) miles of railroad are complete, and 150 miles remain to be executed; but of the construction of these 150 miles, within a brief space of time, there can scarcely be a doubt, now that the Austrian and Spanish governments have taken the respective lines under their powerful protection. Whether these governments are acting wisely, in burdening themselves with a guaranty which must have the effect of adding to the national debt of either country, time alone can solve.

The following is the present state of the line from Trieste, over Vienna, and Berlin, to Hamburg:

	Ready.	In construction.
From Trieste to Gloggnitz,		50 miles.
From Gloggnitz to Leipnick,	40 miles	
From Leipnick to Oppeln,		20 miles.
From Oppeln to Breslau,	10 miles	
From Breslau to Frankfort-on-the-Oder,		34 miles.
From Frankfort to Berlin,	10 miles	
From Berlin to Hamburg,		36 miles.
	<u>60 miles</u>	<u>140 miles.</u>

On the former of these lines, it will be seen, a much larger portion of the work has been completed, a larger amount of capital has consequently been invested, and a powerful rival interest is organized, which will do what it can to deter the timid from investing their funds in a railroad from Berlin to Hamburg. Bohemia, Saxony, Hanover, the Prussian provinces on the Rhine, and Belgium are interested, or believe themselves to be interested, in defeating the Hamburgers, and the consequence has been an active paper warfare, which has of late been extended even to England. Calculations are constantly published in the newspapers with a view to demonstrate the improbability of a remunerating traffic, and a friendly uneasiness is even expressed lest some unfortunate dupes should be prevailed upon in England to throw away their money on so hopeless an undertaking. An instance of this occurred in our own paper, on the 8th instant, when an advertisement of some length was inserted in the shape of a letter, purporting to proceed from an Englishman at Berlin, who was made to give expression to sundry apprehensions lest the purses of his confiding countrymen should be laid under contribution. We have no objection to warnings of this sort. John Bull has, in his time, been seduced to invest a deal of his hard earned money in the purchase of moonshine, and it will be better for him in future to be too cautious than too confident; at the same time, well aware of the quarter whence these warnings proceed, and of the motives that dictate them, we are not inclined to attach much importance to them, or to feel any deep obligation to their authors.

There is no city on the continent in whose welfare England is more interested than Hamburg. Our exports to that city average annually from five to six millions, (nearly the whole being cotton and woollen manufactures and hardware,) and every additional facility of communication with the interior must have the effect of increasing so profitable a trade. The railroads, terminating at Antwerp, run, moreover, through no part of Germany, but the States embodied in the Customs Union; whereas, nearly half the line from Hamburg to Berlin passes through Danish and Mecklenburg territory, where the duties on British manufactures are comparatively trifling, and are likely to remain so, neither of these two countries having any manufacturing interests to protect, and both of them being deeply interested in cultivating a commercial intercourse with England for the disposal of their agricultural produce. The moment either line is complete to Trieste, that line must become the road from England to India, in preference to that over Paris and Marseilles; but there are many reasons why the line from Hamburg over Berlin, about 900 English miles in length, would be preferable to that from Antwerp, over Dresden and Prague, which would be at least 1,260 English miles long.

The people of Hanover look to England for some assistance in carrying out their railroad, in the realization of which they think England almost as much interested as themselves. Individual capitalists, however, will be guided by the prospects of profit only; and of all the continental railroads we know of none that promises better. At the termini of the line we have a population amounting to more than half a million of souls; and although no large city occurs on the way, yet at both extremes the railroad will come into communication with an intercourse of wide extension and first rate importance. The country, moreover, through which the railroad will run is nearly a dead level, and it may be doubted whether there is any railroad of the same length, in any part of the world, in the construction of which fewer natural difficulties have presented themselves, than may be looked for between Hamburg and Berlin. All the railroads terminating at Berlin,

and now in activity, have turned out profitable undertakings, and of all, the shares are now at a considerable premium.

The companies interested in the steam navigation from Hamburg to Magdeburg are also active in their exertions to prevent the realization of the railroad from Hamburg to Berlin, though it may be doubted whether the river traffic, particularly with the steamers, would not continue with nearly the present activity, even if the railroad were in full operation. The travelers to Saxony, Bohemia and Central Germany would still continue to journey up the Elbe to Magdeburg.

The Leipzig-Dresden line has published its annual report, and a very satisfactory report it is for the shareholders. The dividend for the last year is to be 6 per cent., and the estimates for the coming year promise a considerable increase in the receipts, accompanied by a considerable reduction of expenditure. The receipts of 1842 showed an increase of 50 per cent., as compared with those of 1841. Till recently this railroad had been working with a single line of rails. The second line is now completed, and will allow a greatly increased activity. Branch lines are spoken of from Leipzig to Chemnitz, and from Dresden to Chemnitz, as likely to be undertaken in the course of the present year.

No German government is exerting itself more zealously in the cause of railroads at present than that of Austria. The report of the Vienna-Raab company for the last year appears to have been quite an agreeable surprise to the shareholders, who, if we understand aright the abstract that has appeared in a German paper, have received five per cent. interest on their capital, independently of a half per cent. which had been paid over to the reserved fund. The works of the government, however, will in a short time give increased value to this line. The works for the extension of the line to Trieste are in active progress, and so, at the other extremity, are those for the extension of the Vienna-Olmütz railroad to Prague. A treaty has been concluded with the Saxon government for the railroad from Prague to Dresden; so far, therefore, as Austria is concerned, the railroad from the Adriatic to the North sea has been provided for. Even during the winter, from five to eight thousand workmen have been constantly at work on the Bohemian part of the line, but on the return of spring it is intended to strain every nerve to accelerate the great undertaking.

A new German railroad, that between Heidelberg and Carlsruhe, will shortly be opened as far as from Heidelberg to Langenbrücken, a distance of about fifteen miles. Experimental trips were performed on the 26th and 27th ultimo, but we have not yet seen any account of the railroad having been opened for the use of the public.

In the kingdom of Wurtemberg, also, the government has very splendid schemes, which will probably be realized, but not without imposing a considerable additional debt on the country, in the shape of a guaranty fund to the capitalists who advance their money. There are to be private railroads and State railroads in Wurtemberg; the former are to be undertaken by companies, to whom the government guarantees an interest of four per cent. on the capital advanced, reserving to itself, however, the right of buying up the railroad on payment of the money expended on them. The State railroads are to be constructed by the government, and a loan is to be raised to defray the expenditure. Among the lines recommended by the committee of the second chamber is one to connect the Rhine and the Danube, from which several branches are intended to radiate.

In looking at the immense works now in progress in Germany, it is impossible to forbear from speculating upon the vast results that must in a few

years be obtained. With a railroad 900 miles in length it will be quite practicable to travel from Hamburg to Trieste in forty or fifty hours, and thus a saving of several days will be effected in the transit of the overland mail from India to England. The whole system of continental travelling, moreover, must undergo a change; for it will be intolerably absurd to make a man waste days at a railroad station on the formalities of his passport, when in the space of time thus lost he might have travelled from the North Sea to the Adriatic. Will not even the national character be likely to undergo a modification when such rapidity of locomotion has become one of the accustomed occurrences of life in every part of the country?—*London Chron.*

It may not be known to some of our readers, that at the late session of the legislature, an attempt was made to procure a charter for a railroad from New York to Albany and Troy, to be located immediately upon the eastern bank of the Hudson river. This, of course, would have been a rival line to that of the New York and Albany railroad, and in endeavoring to forward their application, the advocates of the "river line" have not hesitated to make the most absurd statements in comparing the two routes. The report from the committee to whom the matter was referred, very properly put the project to sleep—and in doing so, has not spared the absurdities and inconsistencies of the petitioners. Among other things, they quote the very words of a former report of the engineer who now advocates the river route, in which he took ground diametrically opposite to that which he now takes.

In answer to some of the, so called, arguments brought forward, Mr. E. F. Johnson, chief engineer of the New York and Albany railroad company, prepared a statement, which was presented to the legislature. As this paper of Mr. Johnson's touches in one place upon a point of professional interest, we have selected a few paragraphs for publication.

"The river line is also represented to have a maximum grade or inclination of thirteen feet less per mile. Assuming this statement to be correct, it does not by any means follow that any very material advantage is derived therefrom to the river line, either in the average velocity of movement or in the cost of transportation.

Both routes have their termini upon the *same level*. If, therefore, there is more ascent upon one line, it must also have an equal surplus of descent, so that the aid afforded by gravity in the latter case will be precisely equal to the resistance in the former.

For the purpose of illustration, let it be supposed that the rate of ascent on the two lines, for a given distance, to be equal to the maximum on both, namely, thirty feet per mile on the one, and seventeen feet per mile on the other. If with a given power a given load is conveyed up the latter at the rate assumed, of twenty-six miles per hour, the same power will convey the same load up the former at the rate of twenty-three miles per hour, nearly, (see the New York Assembly Documents, No. 133, page 11, 1839,) making a difference in the speed on the ascent of three miles per hour. If these grades occupy half the whole distance, and the journey between the two extremes is performed in six hours, the train which is on the lowest grade will commence its descent about nine miles only in advance of the other, or twenty minutes sooner in time. To make up for this loss of time, on the remaining half of the distance, the train on the thirty feet grade has the bene-

fit, in its descent, of the greater force of gravity on that slope, compared with the slope of seventeen feet per mile; and hence the whole distance will be accomplished with the same expenditure of power in the the same, or very nearly the same time.

If the rate or degree of inclination of the grade line was so great in any part as to render it impossible, from considerations of safety, to derive the full benefit of the aid afforded by gravity on the descending portion, the result would be different and a disadvantage might ensue; but such is not the case where the maximum inclination does not exceed the limit of thirty feet per mile, the average much below that amount.

Admitting it, however, to be possible that some little difference may exist in favor of the lower grade on the river line, yet it cannot be denied that the interest upon the superior cost of that line, amounting probably to not less than \$50,000 per annum, will manifold more than cover the difference in the expense of fuel, or whatever extra power of traction is needful to convey the same load with the same average speed over the interior route.

So far, therefore, as it regards the *through* trade and travel, the interior route will be found to be quite as efficient as the other. This conclusion is in accordance with the experience on all the railways in operation of a similar character, having grades not exceeding thirty feet per mile.

I am aware that the opinion has been advanced that a difference in the elevation of a summit of from seventeen to twenty-five feet per mile is equal, when *equated*, to one mile of horizontal distance.

For very high grades and high summits this rule, *arbitrarily assumed*, might not be widely at variance with the truth; but where the grades range below the limit of thirty feet per mile, and the average, as is the case on the interior route between New York and Albany, does not exceed more than half that amount, the rule is not in the least degree applicable.

With respect to the *way* business, which, if we may judge from the experience upon the New York and Erie and other roads, must constitute a considerable portion of the whole business of the New York and Albany road, the superior elevation of the ground on the interior route will be found an advantage rather than otherwise. This is evident from the fact that the region of country which will furnish a surplus produce for market, is elevated considerably above the line of the road. The road is therefore more accessible from the surrounding country from having this elevation, and will be more likely to obtain in consequence its fair share of business in competition with the river.

There is another and still greater advantage to be derived. The most elevated portion of the interior route is situated, as already stated, near the north line of Dutchess county. From that point to New York city, the grade has an average descent of eight feet per mile for one hundred miles. Nearly all the way freight, forming possibly the greater portion of the freight conveyed in summer, will come to the road in this distance, and as the average descent is in the direction of the preponderance in the trade, being towards the city, more will be gained than lost, in consequence, in the expense of transportation.

As to the amount of way business to be furnished to the railroad, it must be remembered that the proposed river route can only draw to its support that which flows in from *one side*, which for eight or ten months in the year must be divided with the steamboats and other craft upon the river.

It should be borne in mind, in considering the relative merits of the two routes, that the river line will not serve to cheapen the transportation of produce to the city from the eastern river counties, neither does it in the least

accommodate the rich marble and iron region which lies in and near the valley through which the interior route passes.

The interior route also passes through a region at present deprived of any convenient mode of communication with the city."

CHESAPEAKE AND OHIO CANAL.

At a general meeting of the stockholders at Frederick, on the 5th instant, we understand proposals were submitted by capitalists for completing the unfinished portion of the canal between dam No. 6, and the town of Cumberland, as also for the extension of the work to the mouth of Savage. But it will be seen by the annexed report, that the company deferred entering into any contract before affording a reasonable time for any other persons to offer proposals, and thereby release the directors from any censure that might possibly accrue to them, as well as to afford the authorities of the State an opportunity of carrying out the provisions of the legislative enactment with regard to the sale of the work. We think the proper course to be pursued is here marked out, and such an one as will meet the approbation of the friends of the canal.

As to the prospects of the work on the canal being commenced soon, we of course cannot speak positively. We learn that General M'Neill, the president of the company, is still very sanguine in his expectations—that he says the work *will go on soon*, and that, too, to *completion*. We sincerely hope he may succeed. We are indebted to our Baltimore correspondent for the following report :

REPORT.

The matter of the report divides itself into two distinct subjects:—

1st. The accounts, expenditures, sales of property, income from tolls, etc., or in general of the finances of the company. It has not been in the power of the committee to bestow upon these subjects the attention which their importance demands. We beg leave, therefore, respectfully to recommend that a committee of three be appointed by the chair to attend to this part of the president's report.

2d. Of the extension of the canal. We are of opinion that the interest of the State, and all interests connected with or to be developed by the canal, are eminently involved in the early and substantial extension of the canal, in conformity with its plan up to the town of Cumberland, and that to this end the energies of the president and board of directors should be directed with vigor and perseverance.

With this general expression of opinion the committee will bring to the consideration of the meeting the necessity of observing certain precautionary measures, which will now be indicated.

1st. That competition ought to be excited by public advertisement in the newspapers before contract be entered. Proposals to be received by the 26th June.

2d. No attempt should be made by the company to purchase State bonds until the treasurer shall have failed to effect a sale of the State's interest in the canal as authorized; say until the 10th July.

3d. That no contract shall be entered into except with the condition that it may be annulled by the company after thirty days' notice, at any time within twelve months after the date of said contract, on the payment of one per cent. as damages upon the unexpired portion of the contract.

4th. Provided, however, that nothing whatever shall be done by the president and board of directors which may prevent or embarrass the sale by the State of Maryland of her interest in the canal.

True copy of the report of the committee upon the report of the president and directors of the Chesapeake and Ohio canal company, submitted to the stockholders, etc., made June 6th, 1843.

Test.

THOS. TURNER.

At the same meeting the following gentlemen were elected officers of the Chesapeake and Ohio canal company for the current year.

Gen. W. GIBBS McNEILL, *President*.

Directors.

Col. Frisby Tilgham,	} Washington county.
John O. Wharton, Esq.	
William Price, Esq.,	} Allegheny county.
Col. James M. Coale,	
Frederick county.	
Daniel Burkhart, Esq., Berkely county, Virginia.	
J. P. Ingle, Esq., Washington city.	

We have long since expressed our opinion that the Long Island railroad was destined to become one of the most important lines of improvement in the country. From the report now before us, we are pleased to learn that there is a fair prospect of an immediate completion of the work. The amount required for this purpose is but about half of the portion of the capital which yet remains to be called in. For the particulars in regard to cost of construction, etc., we refer to reports themselves.

We cannot but regret that the company have neglected contributing their share to the general fund of information, by not giving the details of expenses of conducting the road. It is true that the line is as yet incomplete, but this is no reason for the omission.

We have not included in our extracts that portion which refers to the prospective traffic of the road, as it was published in the last report. It does not, however, need much argument to convince even the general reader that a very liberal share of the travel east of New York will pass on this road. There is, however, one item which, from the results of our own observation, we feel convinced the directors have underrated—we refer to the local traffic both in freight and passengers. The company have based their calculations for this portion of income, upon the actual receipts for the road as at present in use. That this is far short of what it should be, we suppose the directors themselves do not doubt, and as any one may learn from the fact that several lines of stages do a good business along side of the railroad—in some cases even at a higher fare than that of the railroad. The mere question of undervaluing an item in the prospective business of the road, is of not great importance, and would, doubtless, at some future time, prove a very welcome discovery. But from the little attention this branch of their income has received from the directors, in their report, as well as from the system of management, we feel certain that an increase of attention to this point would result in an increase of profit. It is in vain to say that every exertion should be made to complete the work—this is all well enough—but is it a necessary consequence that the exertions to secure travel upon that portion of the work already completed, should not be made? This would indeed be a queer law,

and one that would forbid any care being bestowed on a road when finished. But a neglect of part of a work, is a neglect of the whole, in the moral, though not in the mathematical sense—and that which is productive of injury to the reputation of a part, is injurious to the whole road. With this view of the case we see far larger and more encouraging prospects than even the most sanguine hopes expressed in the report, would indicate. Upon Long Island alone, a traffic exists in part, and in part is yet to be created, that shall far exceed the most ample share of the eastern travel, ever likely to fall to the share of any one line of railroad or steamboat. Nor do we mean to doubt the estimates upon this point, there is no line of those in operation which can in any way offer the advantages belonging to this, and if nature had endeavored to form land for railroad uses, she could not have produced a better specimen than that traversed by the Long Island railroad.

LONG ISLAND RAILROAD.—REPORT OF DIRECTORS.

The capital of the company, as granted by their charter, is \$1,500,000, in 30,000 shares, of \$50 each. Of this amount, \$28 25 per share has been paid by the stockholders, and the amount has been expended in the construction of the road, leaving \$21 75 per share, or \$653,500 still unpaid.

In giving a statement of the property and effects of the company, it will be proper to state that the road, as far as constructed, is of the permanent description, being laid with the heaviest solid rail of 56 lbs. to the yard, with a heavy superstructure laid the whole distance upon a deep gravel foundation.

The property of the company consists of 34 miles of road with the necessary appurtenances, consisting of turnouts, tables, car and engine houses, machine and blacksmith shops, store houses, dwelling houses, 12 in number, stables, offices, 20 lots of ground in Brooklyn, (Parmentier's garden,) and 50 lots in Jamaica, the Hempstead branch railroad of three miles, 4 locomotive engines, 15 passenger, and 30 burden cars, etc., the right of way for the construction of the road for a distance of nearly 30 miles, and the road-bed graded and prepared for the rails for a distance of 21 miles. The whole work and property having been obtained at a cost rising one million of dollars.

The debts and liabilities of the company are as follows, and payable at the periods stated, viz:

To the State of New York, payable in 1861,	\$100,000 00
In a second mortgage on the road, being a debt originally contracted to the Morris Canal and Banking company, of \$60,000, of which \$20,000 was paid, and the mortgage for the balance of \$40,000 is now held by A. G. Thompson, with whom an arrangement has just been concluded to defer the payment for 4, 5, 6 and 7 years,	40,000 00
Bonds issued in 1840 at 10 years, at 6 per cent. interest, for the Hempstead branch,	12,851 44
Bonds for rent and interest to the Brooklyn and Jamaica R. Co., payable in 10 years from June, 1842,	57,922 00
Four year bonds issued to contractors, and for materials, due in 1845, 1846 and 1847,	37,309 06
Bond issued for iron, locomotive engine, materials, etc., due within the next six months,	12,384 24
Bonds at 10 years, issued to residents of Long Island, for money loaned at 6 per cent., and expended in the construction of the road,	16,825 00
	<hr/> \$277,291 73

The receipts and expenditures of the road, as far as constructed, and operated upon from May 1842 to May 1843, are as follows :

Receipts for passengers,	\$46,241 63 }	\$55,731 84
Receipts for freight,	9,490 21 }	

The expenses for the same period are,

Interest on New York State loan,	\$6,000 00	
Interest on State of Michigan,	1,506 62	
Rent to Brooklyn and Jamaica railroad company,	8,000 00	
For all other purposes, as expenses proper in conducting the road, including repairs,	37,134 74	52,641 36
		\$3,090 48

The balance of \$3,090 48, together with two instalments, of one-half per cent. each, or \$14,500, called during the past year, has been expended in continuing the construction of the road, and for which sum, as well as all other moneys expended, vouchers are on file.

The distance from Brooklyn to Greenport, the proposed terminus of this road, is 95 miles ; the portion now in operation from Brooklyn to Suffolk station, the present terminus, is 46 miles ; of the remainder, 21 additional miles are graded, 16 of which are in direct continuation, and 5 miles more are graded at different points on the line and disconnected.

The terminus at Greenport, from which point it is proposed to connect with the eastern roads by steamboats, is of the most favorable character ; the approach to it is on the direct line of the road, and trains may be run upon the wharf at that place, at which ships of 500 tons are moored, and from which steamboats of any draft of water may take passengers with baggage and burden cars at all times throughout the year.

It may be well to add that with a view to making Greenport the terminus of the road, it has been recently examined by a committee highly competent to judge, that this committee have unanimously decided it to be all that could be desired for that object.

The distance from Greenport to Stonington is estimated at 24 miles ; and about the same number of miles to the proposed terminus of the Norwich and Worcester road, near Gales Ferry, to which point the latter road is under construction, and will be completed in November next. The time required for performing the distance from New York to Boston, on the completion of this road, may be stated as follows :

From New York to Greenport, 95 miles,	4 hours.
Crossing to the Norwich and Worcester or Stonington roads,	2 hours.
From thence, as now performed, to Boston,	4 hours.

Making 10 hours.

Annexed to this report will be found the report and estimate of the engineer of the work, James J. Shipman, Esq., by which it will be seen that the cost of completing the remaining portion of the road to Greenport is \$350,000.

No amount is named in the estimate referred to, as required for the *right of way* ; and it is believed that none, of any moment, will be required. The land has been ceded, for the most part, and in two cases only on the twenty miles of road recently constructed, where the owners of land were unwilling to give their land, the commissioners appointed to assess the damage gave but a nominal amount, probably holding in view the great advantage which would accrue to such land owners by the construction of the road.

The company have recently obtained a decision of the vice chancellor, by which they are relieved from the heavy expense of constructing fences

along the line of the road. This item of expense alone in the construction of the road has heretofore reached as high as nearly \$2,000 per mile.

It is proper here to add, without claiming more for this road than other roads may claim, that from the period of its first operation to the present time, upwards of 750,000 passengers have passed over it without injury to a single individual.

Having placed before the stockholders the condition and prospects of the company, they would call their attention to the report of the engineer with regard to the cost of constructing the remaining portion of the work. By this estimate it appears that the sum of \$330,000 is necessary for that object. By the experience acquired in the construction of 20 miles of road within the last 18 months, it is believed that the estimate is a fair one, and that of this sum, \$250,000 would be required in cash, and that the balance could be obtained on a credit of from 1 to 4 years.

If the estimate referred to be correct it would seem for the interest of the stockholders to have the road completed as early as it could be done, consistently with a due regard to economy.

It is proper to state that some of the stockholders are urgent upon the board to complete the road with all practical dispatch, and place the company in a condition to pay dividends; and they also contend that the present condition of the money market, and the low price of materials, are unusually favorable for that object, and those holding these opinions profess their readiness to pay on their own stock. These representations coming from responsible sources, are doubtless entitled to some weight. The board of directors wish to pursue only such a course as will conduce to the immediate and permanent interest of the stockholders and the public.

The board are of the opinion that the time has now arrived when it becomes expedient to make a vigorous effort to complete the Long Island railroad from its present terminus to Greenport, and which can only be done with a due regard to economy, by raising funds from the stockholders sufficient to meet the expenditures. The president has accordingly been authorized and directed to call an instalment of one dollar and a half per share, payable on the 1st July next.

This matter is now submitted for the mature consideration and decision of the stockholders, with the single remark, on the part of the board, that in every view which they have been able to take of the subject, the conclusion is irresistible, that the expenditure upon this road, of the sum stated, will immediately and permanently enhance the value of the stock far above its present cost, and bring into successful operation a work, the extent and productiveness of which, (with a single exception,) it is believed, will exceed that of any other road in the middle or northern States.

By order of the board,
GEO. B. FISK, President.

New York, June 15, 1843.

ENGINEER'S REPORT.

To the President and Directors of the Long Island Railroad Company.

GENTLEMEN—I have the honor of submitting the following brief report and estimate of the cost of the graduation and superstructure of the Long Island railroad from its present termination in Suffolk station to Greenport.

In making this estimate I shall omit taking notice of the cost of right of way, and the necessary docks and other fixtures required at Greenport, for which I have no data, and I shall take the present contract prices, considered as payable wholly in cash, as the basis of my estimate, the cubic yards

of excavation being increased to cover the grubbing and clearing. The item of masonry is also omitted because we have but two culverts on the line of more than 12 feet span, and those, owing to the entire absence of stone along our line, are made of timber truss work, the cost of which is estimated under the item of superstructure.

Estimate of excavation from 2d division to Greenport.

690,500	cubic yards at 8 cents per yard,	-	-	55,240	00
250,000	" " completed at 8 cents per yard, -	-	-	20,000	00
440,500	" " balance unfinished at 8 cents per yard,			\$35,240	00
I submit also an estimate of the superstructure:					
4128	tons iron rail and spikes at \$60,	-		\$247,680	
	Mud sills and ties for 48 miles at \$420	-	-	20,160	
	Workmanship, " " at \$400	-	-	19,200	—287,040 00
					\$322,280 00

I would also state that the character of the graduation is such that it may be completed nearly as fast as the iron can be laid down, and that the retracing of the line beyond Jamesport would require a month or six weeks time, while the whole line from Jamesport west is now ready for the contractor. The whole line can be completed as respects graduation in four months without any question, and we have at this moment twenty-three miles in readiness to receive the superstructure.

The condition and prospects of the work under your direction will, I conceive, justify me in congratulating the stockholders and directors upon the near prospect of its early completion. The whole extent of our country, from one extreme to the other, will not present a line possessed of similar advantages, its western terminus at two great cities, Brooklyn and New York, the mainsprings of energy and enterprize, with a population of 360,000—its construction through the centre of an island itself containing 100,000 inhabitants, entirely free from navigable rivers, without a bridge for an hundred miles, and with grades of an average less than ten feet per mile; having six curves only, with radii not less than 5000 feet in 80 miles, admitting of any desired velocity, and with its eastern termination on one of the most beautiful harbors in the Union, within 5 hours of the city of Boston in all weathers. We may in brief, sum up the advantages you possess to enable you to withstand all competition in the following particulars, the shortest possible distance, the greatest velocity, the most perfect and solid superstructure at an expense less by 40 per cent. than any similar road in the world, and finally, a capacity of performing a profitable business at the lowest prices. All these are advantages inherent in your enterprize; and entirely independent of all improvement in machinery, which other machines may supercede, for no invention can nullify the fixed and immutable laws of nature; these devices serve only to economize power by new modes of application, which, owing to your unrivalled position, will still farther increase your capacity for business. I cannot believe that an enterprize so full of the elements of success will be suffered by the intelligent and active officers at the head of its affairs any longer to linger out a sickly existence when the land of promise so invitingly lies before them, and nothing more is required than to reach forward and possess that which they have so manfully struggled to obtain.

Respectfully submitted,

JAMES J. SHIPMAN, Chief Engineer.

READING RAILROAD AND THE COAL TRADE.

We were not a little surprised to find, while on a visit to Philadelphia a short time since, an apparent hostility among the citizens to the *Philadelphia, Reading and Pottsville railroad*. That there should be among those interested in rival works, a degree of hostility towards this road, which is likely to prove so formidable a rival, is not very surprising, but that others, whose interest is apparently in no wise interfered with, should evince hostility to *such* a work, is truly surprising. It is said by some that the Schuylkill Navigation company could bring down all the coal that can be mined in the Schuylkill region, and therefore a railroad was unnecessary. Possibly all the coal of the Schuylkill region might for some years yet, come through the canal, and at the old price of \$2 00 per ton, yet, even if it might, that is no reason why other means of transportation should not be prepared *in time*, by which the supply of coal may be increased, and by competition—aye *competition*, there's the rub—in transportation, as in mining, the *price reduced*. It is hardly to be supposed that consumers will find fault with a measure which tends directly to reduce the cost of coal, unless perchance they have interests adverse to a reduction, either in *coal mines*, or other *modes* of transportation, yet we found many individuals who appeared decidedly opposed, if not hostile to this great work, which promises to be of vast benefit to community, by a direct reduction in the price of coal, the consumption of which is rapidly increasing in all parts of the middle and eastern States.

In 1842, over 540,000 tons of coal were sent from the Schuylkill mines, by canal and railroad, and it is now believed that over 600,000 tons will be sent this year. The cost of delivering this coal at Philadelphia, on the wharf and on board vessel was, previous to the competition of the railroad, over two dollars per ton; now by the railroad, it does not exceed \$1 40—thus effecting a saving to the consumers of the 540,000 tons shipped last year of \$324,000, and this saving was effected by the Reading railroad. Boats of the Schuylkill Navigation company are now carrying for 70 cts., and toll 54 cts. per ton, which with the unloading and re-shipping on board vessels at Philadelphia makes it over \$1 40 per ton on board of vessel or in the depot of the company, thus making a saving to the consumer on the 600,000 tons from the Schuylkill region of \$360,000 the present year. But this is not all the advantage, or economy to the consumers of coal. The whole amount of coal sent from the entire anthracite region of Pennsylvania in 1842, was 1,108,001 tons, only a fraction more than *double* the amount from the Schuylkill region alone. The Schuylkill is, we believe, the favorite in every market—of course, then, a reduction in the price of Schuylkill, of which so much is used, will carry all other kinds with it, and, therefore, we may safely assume that the Reading railroad has produced a saving to the consumer of sixty cents per ton on the entire amount sent to market, which will, this year, no doubt, be equal to, if not greater than last year—and amount to over \$600,000.

But to understand fully the value of this improvement, we must look to the future. The *entire* consumption of anthracite coal in 1822, was only 2,240 tons—of which not a bushel came from the Schuylkill mines. It was not till 1825 that coal was sent to market from that region which now supplies one-half, into a few tons, of the entire consumption. In 1832—363,871 tons were sent to market—in 1842, 1,108,001 tons—may we not assume that the increase will keep pace, for ten years to come, with the past ten? and that in 1852, there will be at least 2,500,000 tons sent to market? We think so—and that they will be prepared to transport from the Schuylkill region, and deliver it on board of vessels, or in the yards at Phil., for \$1 12½ per ton.

It is asserted by some that the railroad cannot compete with the canal—and, therefore, that it can never succeed; as to *competing* with the canal, *that*, we presume, is not the object of the railroad company. We suppose their intention is to carry the coal to tide water at a price, and in a *manner*, satisfactory to the dealers, and we have no doubt of their ability to do so, when they shall have laid their double track from Reading to Pottstown, and have increased their cars and engines according to their present designs.

Few people, indeed, who have not visited this railroad, can appreciate its great advantages for heavy transportation. The entire line from Pottsville to Falls of Schuylkill, 88 miles, is either level or descending, and, therefore, with *good* cars and engines, there is scarcely a limit to its capacity to transport coal, as will be seen by the statement, on another page, of Mr. G. A. Nicolls, superintendent of transportation, in relation to the performance of "Monocacy," a locomotive built by the Newcastle Manufacturing company, at Newcastle, Delaware. It is believed that that engine would have readily taken *twenty* additional cars; making up the load to 400 tons nett, exclusive of *cars*, and without injury to the road—thus establishing, beyond question, that they may at all times rely upon good engines' taking 200 tons of coal, or 66 cars, and more if necessary; and thus with thirty locomotives for freight and 2,500 coal cars, they can average *ten trains* a day, or 12,000 tons a week, or 600,000 tons a year—allowing two weeks for snow storms—which at \$1 40 per ton, gives \$840,000 a year for coal alone, without reference to passengers and ordinary freight, which will, in a few years, become an important item. It may be said that this calculation cannot be realized at *present*, and it may be as truly said that in ten years, and much less, it *will* be realized, and *exceeded* by fifty per cent.

It is said by some that this road cost too much. It has truly cost a *large* amount of money, over \$5,500,000. Yet it must be taken into the account that the great object in view has been to obtain the *most favorable* grade possible, for a *heavy* trade *one* way, and to accomplish this, *rivers* have been bridged, *vallies* filled up, *hills* cut down and *mountains* tunnelled. The gentlemen in charge have judged wisely that for a heavy trade, a *good* road *was* necessary, and they have made such a road—notwithstanding the natural difficulties, the unceasing opposition, and the general depression of business operations for several years past.

There are three tunnels on this road, one 962 feet, one of 1,600 feet and one of 1,932 feet in length, by the last of which a bend in the river is cut off and the distance of several miles saved. The passage through this splendid tunnel and over the river, on a beautiful curved stone bridge, as the train emerges from total darkness at great velocity, is truly grand; and indeed the beautiful and highly cultivated valley of the Schuylkill nearly the whole distance to Pottsville, and the great variety of beautiful scenery constantly presenting itself to view when approaching the coal region is exciting beyond description. The passage of boats on the canal, loaded with coal, in one direction, at three miles an hour, while the cars are going at the rate of 20 miles in another; the assembling of cars loaded with coal, on the railroad from different directions; and the puffing of half a dozen locomotives, waiting with long trains of cars attached, for the arrival of the up train; the delightful and bold scenery breaking upon the view as the train winds among the hills, and the flourishing busy village of Pottsville, all tend to render this one of the most delightful excursions that can be enjoyed in the vicinity of Philadelphia; and a little effort and management and perseverance are only necessary, to render it one of the most frequented by the lovers of nature and the country—until the vicinity of the railroad becomes studded with beautiful country seats. But to effect this the system of "*low fares*" must be adopted. And here a word to the managers of the road, which, however, we must defer until our next number.

UNITED STATES NAVY.

The Army and Navy Chronicle presents the following *glowing* picture of the condition and mismanagement of the United States ships of war. It cannot be denied that there has been a gross waste of money in this department of our government—especially in the abortive early attempts at *steam frigates*. If the government would contract with individuals or companies for the construction of a few steam vessels of the various descriptions desired to come up to a certain standard—or not to be taken by the government—and then give *future* contracts to the most successful competitors, we will guarantee that as many steam ships, of the most improved construction, as may be desired by the government, will be furnished at three-fourths, or even *two-thirds* the cost of those built at the navy yards, where it is well known that labor does not *always* produce the greatest effect.

A GALVANIZED STEAMER.

Besides the sloop of war that has been ordered to be built at the Washington navy yard, we understand preparations are making also for building an iron man of war steamer. We have not understood what is to be her size—*small*, though, we hope. This business of steam men of war is new, and our true policy with regard to it is contained in the Spanish *refran, poco a poco, senores*. In the building of the Mississippi and Missouri, we have overshot the mark; precisely as we did in laying down the keels of so many 71s just after the war. There was the Independence, 74; she performed one short cruise, we think it was; and to be of any service had to be razed down to a frigate. There is the Washington, 74; she has been once to the

Mediterranean and back, and she has now to be broken up as not worth repairing. There is the Franklin, 74; she has been one cruise to the Pacific, and a short time in the Mediterranean. She is hogged, and is now to be sent round to Boston, (*if the New Yorkers will let her*, for they have been making great efforts to retain her there,) to be cut down into a frigate. Then there is the Columbus, 74; she has also performed but one or two cruises, in a life time of twenty odd years, and will, when she returns, perhaps, never perform another as a ship of the line. There's the magnificent 120 gun ship, the Pennsylvania, rotting at her anchors; and we have heard doubts expressed as to whether she would even now be sea worthy; at all events, it is a question which in all probability will never be put to the test, unless we should have war very speedily. The Ohio has been in the water for twenty odd years, and has been one cruise. The Delaware is now abroad and the North Carolina is at New York. Besides these, there are on the stocks, where they have been kept since the war fever for 74s subsided, the Alabama, the Vermont, the Virginia and the New York. Any two of these could have performed twice the service that has been required of them all put together. And so far, we have been quite as unfortunate with steamers. The old Fulton got as far once, we believe, as Sandy Hook; she put back, and laid at the navy yard wharf for years, until she was accidentally blown up. Her modern namesake is an egregious failure, is not seaworthy, and will never repay the navy or the country for the consumption of one day's fuel. The Mississippi has proved too expensive, and has shown the country that "it costs more than it comes to," by a long shot, to keep her at sea; therefore, she has been put out of commission and laid up. The Missouri, after the same order, has been made the subject of the most silly experiments. She also will teach a similar lesson—that large steamers, like large ships, are not the thing. We have no colonies abroad at which we can found naval stations, and erect depots and magazines for the safety in war of our man of war steamers on the other side of the globe. If we have them never so large, they must always turn homeward for fuel in war. This being the case, we want small ones rather than large. The cost and expense of the Mississippi and Missouri would build and keep in commission some ten or a dozen small ones, of three or four hundred tons each. In peace, each one of these would answer all our purposes quite as well as the largest; and in war, all of them together would be much more efficient and desirable than the two large ones. But in expressing our preference for small steamers over large ones, we wish distinctly to put in a *caveat* against those who have been tinkering with the Missouri having anything to do with hull, engines, boilers, furnaces, or smoke pipes of the one about to be built. Being of iron, too, it is an experiment; therefore, we repeat, *poco a poco caballeros*. Do not let the navy bleed to death with experiments. Let her be of the smallest class of war steamers, so if there should be a failure about her, or any great mistake, or any room for improvement, or any new discoveries which may injure her usefulness or render her unserviceable, let the loss fall lightly, where losses have been so frequent and so heavy—as Jack would say, "ease them off handsomely." Economy is the word now. It is the only thing, and that, too, of the most rigid kind, that can save the navy. As good citizens, as friends of the navy, we go for it; and whatever is at variance with it—henceforth, whatever is wasteful or extravagant in naval expenditures, it shall be our highest duty to expose and rebuke.

 BOSTON AND FITCHBURGH RAILROAD.

The *fifth* important line of railroads, radiating from Boston, it will be

seen by the following notice, is in course of rapid construction. Thus it is that the Atlantic cities except New York, are all pushing forward important lines of railroad—opening easy and rapid modes of communication with the interior and with other cities, by which they can compete successfully with New York in supplying the country with merchandize, and at the same time interrupt our usual supply of produce; and if we are not more enterprizing we shall have to send to Boston for our supply of milk, butter, eggs, etc., as we have already for pork, which can be done in a year or two with great ease, or as soon as the *Long Island* railroad shall be completed, which we believe is now in a fair way to be accomplished.

Boston has her railroad to *Providence* in Rhode Island; to *Albany* in New York; to *Concord* in New Hampshire, and to *Portland* in Maine; and now she is pushing for *Burlington* in Vermont; and will reach there, too, in less than five years. And adopting the policy of "low fares," by which they are sure to attract the business and travel from a vast extent of the most populous and enterprizing portion of the Union.

Philadelphia, too, has her Columbia railroad and canals to Pittsburg; the Camden and Amboy road, and connection with the road from Trenton to New Brunswick and New York; the railroad to Wilmington and Baltimore; her Germantown and Norristown railroad; and last—but by *no means* least important—her *Reading* and *Pottsville* railroad: besides her numerous canals, by which she is supplied with the necessaries and the luxuries of life at all times, and at rates more in accordance with the times than in New York; and she can, also, and *will* furnish large supplies to the interior, which would be sought for in New York, if her citizens were as well accommodated with numerous and rapid modes of communication. So also with Baltimore, with less than a third of our population, but *double* our far-seeing enterprize and public spirit, she has *four* important lines of road in as many different directions, all now in successful operation. The distance now from Baltimore to Philadelphia is only $6\frac{1}{2}$ to 7 hours; whereas a few years ago it was by no means *certain* how long. 'Tis true, on this road, they hold to the absurd high rate of fare, \$4, which should be *at once* reduced to \$3, or even to \$2 50.

The Susquehanna railroad, connecting Baltimore with the *Garden of Pennsylvania*, and opening a direct communication with Pittsburg and the *far west*, is an evidence of her enterprize; and it is to be hoped that it may richly repay those who have invested their capital in it.

The railroad to Washington as well as that to Philadelphia, were matters of *course*—works *not* to be avoided in this go-a-head age—yet the people of Baltimore are nevertheless entitled to great credit for constructing so good a road as that to Washington, at a period when engaged in so many other important works of great magnitude. But the *eminently great* work, undertaken by Baltimorean enterprize, and at a period, too, when the capacity and importance of railroads was but little understood, is the *Baltimore and Ohio* railroad, designed to open a direct and rapid intercourse with the

vallies of the *Ohio, Mississippi* and the *great west*; a work which will insure a rapid advancement, and prosperity commensurate with the boldness of the undertaking and the indomitable perseverance with which it has been prosecuted more than half the distance, and into the immediate vicinity of a vast coal and iron region.

Thus have *Baltimore, Philadelphia and Boston* shaken hands with the people in all directions, invited them to dinner and treated them to the delicacies of their extensive markets—who will of course reciprocate their civilities and send them milk, butter, eggs and bacon in return. While *New York*, the great natural depot for the eggs, milk and notions of the whole country is resting upon her laurels! in having 14 miles of *Harlem* railroad, 45 miles of *Long Island* railroad, 53 miles of *New York and Erie* railroad and the privilege of using the *New Jersey* railroads!!!

Fitchburgh Railroad.—This excellent project, which connects with the Fresh Pond railroad, starting from Charlestown, is one of those railroads in the State which have asked for no assistance from the legislature, but has been commenced and carried on by the might of its own energy and enterprise. It is now in a condition of great forwardness, and, and will soon be finished. The subscriptions to the capital stock have reached \$660,000. The road will pass through Somerville, Cambridge, Watertown, Waltham, Concord, Groton and Lancaster to Fitchburgh; and eventually to Keene, southern Vermont and lake Champlain. The first 27½ miles, extending from Fresh Pond to Groton, have been contracted for by Messrs. Belknap, Gilmore and Co., who built the railroad from Portsmouth to Portland. Seven hundred laborers are now engaged on the line. Five hundred tons of iron have been ordered by the Acadia, and the line will be opened to Waltham in September, in about four months after commencing operations.

LOCOMOTIVE ENGINES OF 1843, IN COMPARISON WITH THOSE OF 1829.

It is probably distinctly recollected by our readers that the Liverpool and Manchester railroad company, in April, 1829, offered five hundred pounds sterling for a locomotive engine, not to exceed six tons in weight, which should haul twenty tons on a level road ten miles an hour; and an engine of this capacity was then unknown in the world. Fifteen years, however, have made astonishing changes; locomotives are now in common use which will haul over 500 tons on a level road ten miles an hour. At that period, 30 feet rise to the mile was considered a serious obstacle, but now 70 to 85 feet rise to the mile is easily overcome with heavy trains, and with passenger trains at a speed of 15 to 18 miles an hour. The following statement of the performance of the "MONOCACY" engine, built by the Newcastle Manufacturing company, at Newcastle, Delaware, under the direction of Andrew C. Gray, Esq., exhibits an improvement in railroad machinery truly astonishing, and commends highly to railroad companies the engines of that establishment.

Statement of the performance of the "Monocacy" Engine with a train of one hundred loaded coal cars on the Philadelphia, Reading and Pottsville railroad.—April 28th, 1843.

The above engine left Pottsville at 6 $\frac{1}{4}$ A. M., and passing six coal, passenger and freight trains on the road, arrived at the Falls of Schuylkill, 88 miles from Pottsville, and 6 from Richmond, at 6 P. M.

The time actually consumed in *running*, was 6 hours and 50 minutes; or at the rate of 12 $\frac{2}{3}$ miles per hour the whole distance. The train was taken up the forty-three feet grade at the Falls in two drafts, assisted by another engine, and reached Richmond, 94 miles from Pottsville, at 7 $\frac{1}{4}$ the same evening.

Nett weight of coal, 335 tons; of cars, 205 tons; making the gross weight of train, not including engine and tender, 540 tons of 2240 lbs. Whole length of train, 1250 feet; amount of freight on coal, \$498.

The above train was fully within the power of the engine; the latter working with great ease during the whole trip.

The Monocacy is an eight wheel engine, built by the Newcastle Manufacturing company, Newcastle, Delaware.

Whole weight of engine, in running order, with water and fuel, 13 $\frac{6}{10}$ tons—do., on 4 drivers, 8 $\frac{13}{10}$ tons—cylinders 12 by 19 inches.

G. A. NICOLLS, *Supt. Transportation.*

STEELED JOURNALS AND CHILLED BOXES.

When on a recent visit to Newcastle, Delaware, a few days since, we learned that the use of steeled journals and chilled boxes in railroad machinery has effected a more important change in the economy, of the few roads which have as yet adopted them, than is generally known. When well made and properly used, the chilled box and steeled journal axles for passenger or freight cars, are decidedly preferable to any other form of journal or box. They combine strength, entire security, freedom from friction and cutting, and durability to such an extent, that on the roads where they are used, nothing better is hoped or looked for. Not a drop of oil is necessary. a pound or two of palm oil mixed with tallow will be sufficient for an eight wheel car for months.

On the Newcastle and Frenchtown railroad, where they have used the same chilled wheels, steel journals, and chilled boxes for *six* years, a recent inspection of them has shown them to be now as good and perfect as they were on the day they were first placed under the cars. The large eight wheeled freight cars on that road have been running every day since the 20th March last, and have not cost one cent for unguents of any kind, and the determination of the agent of that road, is to run the same cars until the winter, without additional oil or grease. An instance of one of these journals and boxes fracturing on this road has not been known. On the Charleston and Hamburg railroad, in South Carolina, the same description of boxes and journals, as we are informed, are used with equally satisfactory results.

Captain Robert H. Barr, the agent and superintendant of the Newcastle and Frenchtown railroad, has in his possession some interesting facts in reference to the use of these articles which were promised us for publication, and he will be willing at all times, we dare say, to communicate the results of his experience to those interested in the management of railroads.

We were also shown a wheel on one of the freight cars, cast with a wrought iron ring in the rim, which was broken by accident, and yet it has been in *constant use* for several years, and apparently as safe as any other wheel in the train. — This illustrates very clearly the value of wheels cast with the wrought iron ring in the rim, and we would recommend those railroad companies, who have never used these very important improvements, to adopt them, and to send to A. C. Gray, Esq., for information in relation to them, as well as for the work when wanted, as we have good reason to believe that it is to be relied on in all respects.

PROGRESS OF RAILROADS IN EUROPE.

We give in this number, from the London Morning Chronicle, an interesting account of the progress of railroads in Germany. The Emperor of Russia is also pushing forward his great work from *St. Petersburg to Moscow*, and *designs*, we doubt not, to continue it to the shore of the Caspian sea. He has drawn into his service able engineers, machinists and mechanics, from *this*, and we presume also from *other* countries; and has large orders for machinery in course of execution, now, both in Philadelphia and Baltimore, which are to go out this season. Indeed, but for the *foreign* orders for locomotives, excavators and other machinery, many of our industrious mechanics would be now without employment.

We understand that Major Whistler, who has charge of the railroad, is highly esteemed by those in whose service he is now engaged; and also that Mr. Joseph Harrison, of Philadelphia, and Mr. Thomas Winans, son of Ross Winans, Esq., of Baltimore, both of whom have gone out to superintend the erection of large machine shops, under the patronage, and at the expense of the government, are well satisfied with the reception they have met with.

Thus it will be seen that the *monarchical* governments of Europe duly appreciate the vast importance of railroads as a means of controlling the people; but if we are not mistaken, *railroads* are the precursors of *liberty and equality* to the *people* everywhere. *Intelligence* leads directly to liberty and equality, and railroads cause the "*schoolmaster to be abroad*."

MISSING NUMBERS OF THE JOURNAL.

If any subscriber to the Journal desires to supply missing numbers to any volume since July, 1838, they are requested to give *early* notice, that they may, if possible, be supplied now when we have some odd and surplus numbers on hand.

EXTRAORDINARY PHENOMENON.

A singular discovery was recently made in the office of the **RAILROAD JOURNAL** and **Mechanics Magazine**, when its former editor and founder returned to his old station, after a long disconnection from it. On looking about the office he discovered that one very important book, the *Ledger*, was out of its place. It was replaced on the shelf, where it belongs, but, singular as it may appear, whenever he returned to the office, after a short absence, the *Ledger* was out of its place, which induced an investigation into the cause of the occurrence. After diligent search, and due deliberation, we were led to the conclusion that this singular phenomenon—if it is singular in publishing offices—can only be accounted for in the following way. On turning over the leaves, he discovered that on *one* side of the page there were numerous entries, thus—A. B., *Dr.* £1—C. D., *Dr.* £2—and E. F., £3—and so on through the alphabet; whereas, in very many cases—*quite too many* for the interest of the editors—there was *no corresponding* entry on the *opposite* side, and on adding up the two columns, he found a difference of £500 or £600 in (the weight of) the two sides of the *Ledger*; thus accounting, in a very *natural* way, for the uneasiness of the—*Editors*, if not of the—*Ledger*. We shall be gratified to learn if any similar occurrence, from *like cause*, has ever been heard of. If there has been a *solitary* instance, it should be put on record for the benefit of future historians. And it is not, for a moment, doubted but that those, opposite to whose names these *blanks* occur, will *immediately* have them filled, so as to enable us to determine the cause of so singular an occurrence; and we would suggest the propriety of an experiment by which the ballance may be thrown on the *other side*, that we may be able to ascertain whether it will cause a similar tendency in the book to be out of place. Should it, fortunately for the *Journal*, for *once* get on the *other side*, and produce a similar propensity in the book, we will go security that the *Editors* will never complain—though, as in duty bound, they will certainly record a phenomenon so singular.

✍ And now, my dear sir, we ask your hearty co-operation in the good cause. We ask you to recommend the **RAILROAD JOURNAL** to others, as well as to take it yourself, and to remit the amount of their subscription with your own. We think it should be taken by Stockholders generally, and especially by Railroad Companies—several copies for each, to distribute among those in their employ—and that Railroad Companies should Advertise on its cover, that it may be sought for by travellers and others, and thus diffuse more generally, correct information in relation to the character of Railroad Stocks as an investment. If the different Railroad Companies in the United States would take five or ten copies each, and advertise their rates of fare, at \$10 a year, the circulation of the *Journal* would soon reach 5 or 6,000 copies, and be the means of disseminating widely, information exhibiting the success of railroads in this country and in Europe, which now seldom reaches the people. And it is for the interest of every Road, and every Stockholder, and every Engineer, to have the subject better understood. We therefore request you to give us the benefit of your influence in extending the circulation of the *Journal*, and we pledge ourselves to labor diligently in the cause.

The EDITORS.

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